EXHIBIT A

AGREEMENT
CONTRACT 95-2A

260

EXHIBIT #3 Defendant

For BIOREMEDIATION, CANTON DROP FORGE, CANTON, OHIO.

THIS AGREEMENT, made and entered into at Canton, Ohio, this 14th day of June, 1995, by and between Canton Drop Forge Inc. (CDF), hereinafter called CDF, and The Critter Company Inc., a corporation, with an office located at 6890 E. Sunrise Drive #120-10, Tucson AZ 85715, hereinafter called the "CONTRACTOR".

WITNESSETH

That the CONTRACTOR has agreed and by these presents does agree that the CONTRACTOR, for the consideration of $117,000.00 paid by CDF hereinbefore mentioned and contained in the proposal, and under penalty expressed in a bond bearing even date with these presents, and herein contained or hereunto annexed to furnish at his own cost and expense, all the necessary materials, labor, superintendence, tools and equipment, and shall execute, construct, finish and test in an expeditious, substantial and workmanlike manner, said improvements shown on the contract drawings described in the included specification or required by CDF, with all equipment and appurtenances, commencing work within (10) days from the date of notice from CDF to commence work and executing the same within the time and in the manner specified and in conformity with the requirements set forth in the specification herein contained or hereunto attached in accordance with the contract drawings of said work on file in the office of CDF and all to the acceptance of said CDF.

The project will consist of removing the sludges lining Lagoon #1 and Lagoon #2 and using ex-situ bio-remediation technology to reduce Total Petroleum Hydrocarbon (TPH) contamination levels of the excavated materials to below the target level of 380 ppm.

The estimated removal quantities are 3,000 c.y. from Lagoon #1 and 6,000 c.y. from Lagoon #2. During excavation the contractor shall maintain quantity estimates and keep CDF informed of the quantity removed. If it appears that material beyond the estimated quantity will require removal, the contractor shall immediately contact CDF representatives. CDF may halt removal prior to reaching the estimated quantities or request the removal of material beyond the estimated quantities. Payment will be based on the actual quantity of material removed and the unit prices. Tasks related to the bioremedation project include, but are not limited to, excavation of lagoon linings, transport of excavated materials to the on-site treatment areas, treatability studies, bio-cell design, bio-cell construction, bulking of excavated materials to enhance bioremediation, inoculation of materials to be treated and maintenance of biocell(s).

Once excavation of the lagoon materials is complete the contractor shall immediately "seed" the lagoon lining and walls prior to putting the lagoon back into service.

The contractor shall also estimate the type and number of samples for laboratory analysis that shall be retrieved by an independent agent.

The CONTRACTOR shall proceed with the said work in a prompt and diligent manner and shall do the several parts thereof at such times and in such order as the Engineer or his duly authorized agent may direct. Further, he shall complete the whole of said work in accordance with the specifications and contract drawings to the satisfaction of CDF and their Engineer.

If the CONTRACTOR shall fail to comply with any of the terms, conditions, provisions, or stipulations of this contract according to the true intent and meaning thereof, then CDF may avail itself of any or all remedies provided in that behalf in the contract, and shall have the right and power to proceed in accordance with provisions thereof.

It is hereby agreed by the parties to this Agreement that the provisions contained in the "Invitation for Bids", in the "Information and Instructions to Bidders", in the "Proposal and Bid Form", in the "Insurance Specifications", in the "Performance Bond", in the "General Conditions", in the "Supplemental General Conditions", and in the Lab Reports for the improvement, shall constitute integral parts of the agreement and collectively that they shall comprise and be known as the Agreement. It is hereby mutually agreed that CDF is to pay and the CONTRACTOR is to receive, a full compensation for furnishing all materials and labor in building, constructing, and in all respects completing the herein described work and appurtenances in the manner and under the conditions herein specified, the prices stipulated in the proposal herein contained or hereto annexed.

The CONTRACTOR agrees not to discriminate against any employee or applicant for employment because of race, color, religion, sex, or national origin. Such action shall include, but not be limited to the following: employment, upgrading, demotion, or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

Subject to the applicable provisions of law, this Agreement shall be in full force and effect as a contract from and after the date when a fully executed and approved counterpart hereof is delivered to the CONTRACTOR.

IN WITNESS WHEREOF, the parties hereunto affixed their signatures, the day and year first above mentioned.

CONTRACTOR

Witness: Nancy Corn

Date: 6/9/95

THE CRITTER COMPANY, INC.

By: [signature]

Title: President

Attest: [signature]

Date: June 14, 1995

CANTON DROP FORGE, INC.

By: Jerome P. Dussault

2(b)
3(b)

The following items shall be considered to be part of the Canton Drop Forge Bioremediation contract documents.

EXCAVATION COORDINATION

All instruction and coordination regarding the excavation, transportation and placement of soil and sludge shall be the sole responsibility of the Bioremediation contractor. Invoices for excavation services shall be passed directly to CDF with no mark-up. Payment for excavation services shall be made by CDF directly to the excavation contractor. All invoices from the excavator shall be approved by the Critter Company prior to payment by CDF.

PROGRESS MONITORING AND PAYMENT

Monitoring shall be achieved by sampling the biocell contents and testing for TPH by EPA Method 418.1. Target levels of 380 mg/kg will be used for this project.

Progress sampling shall occur approximately once a month during summer months and once every two months during winter months. Each sampling session will consist of five (5) random samples from the biocell material. When the average TPH concentration of the five (5) samples is less than the appropriate level, and no single sample has a TPH concentration more than 15 percent (15%) above the treatment level, the appropriate payment will be made. PHC-DRO analysis will be performed on composite samples at the beginning, approximate middle, and end of treatment.

Payments shall be made based on the treatment level achieved.

After establishing initial contamination concentration with five (5) random samples, payments will be made according to the following:

HAMMONTREE & ASSOCIATES, LIMITED

w:progress

FIRST 4,500 CY

Treatment Level (% reduction of TPH)	Payment, %
25%	18%
50%	9%
75%	9%
100%*	9%
Total	45%

SECOND 4,500 CY

Treatment Level (% reduction of TPH)	Payment, %
25%	18%
50%	9%
75%	9%
100%	9%
Total	90%**

*Target level of 380 mg/kg by EPA Method 418.1 is to be achieved, see section titled "Acceptance of Target Levels".

**The final 10% payment will be made one month after achieving target levels, provided that a confirmatory set of lab results indicate that acceptable target levels have been achieved.

HAMMONTREE & ASSOCIATES, LIMITED

wprogress

ACCEPTANCE OF TARGET LEVELS

Sampling sessions will consist of five (5) random samples from the biocell material. When four (4) of the five (5) random samples are below the target level of 380 mg/kg and the fifth random sample is not more then ten percent (10%) over the target level, treatment of the material within the biocell shall be considered conditionally complete. Three more random samples shall then be taken to verify treatment progress. If two (2) of the three (3) additional random samples have TPH levels less than or equal to 380 mg/kg and the third sample is not more than ten percent (10%) over the target level, treatment of the material within the biocell shall be considered complete and payment for that portion of the project paid.

REMOVAL OF SLUDGES AND SOIL FROM CDF SITE

No material from the CDF site shall be removed from CDF property without CDF consent. Should material removal be required for any reason, CDF materials shall not be mixed with any other materials (bulking, etc.) without CDF consent. The location and status of all materials leaving CDF shall be communicated with CDF as requested.

FACSIMILE TRANSMITTAL

Exhibit "A"

5(a)

EXHIBIT #4 Defendant

DATE: 12/14/94 TIME: 3:00 ( ) A. M. (X) P. M.

TO: NAME: SCOTT KLINGENSMITH
BUSINESS NAME:
FACSIMILE NUMBER: (614) 431-8190

FROM: HAMMONTREE AND ASSOCIATES, LIMITED
5233 STONEHAM ROAD
NORTH CANTON, OHIO 44720

TELEPHONE NUMBERS: (216) 499-8817 CANTON OFFICE
(216) 633-7274 AKRON OFFICE
(216) 499-0149 FACSIMILE

SENDER'S NAME: GENE HILL
PROJECT: CDF - LAGOON #1
NUMBER OF PAGES (INCLUDING THIS PAGE): 2
BRIEF DESCRIPTION (OPTIONAL):

ADDITIONAL INSTRUCTIONS OR MESSAGES TO RECIPIENT:

SCOTT,
THE FOLLOWING PAGE IS A SUMMARY OF LAB RESULTS FOR CANTON DROP FORGE.

CDF004157

GENE

LAB ANALYSIS SUMMARY

	Sample # / Parameter	W-1	1	4	5	6	Regulatory Limit
MISCELLANEOUS	Reactive Cyanide (ppm)	<0.5	<0.5	<0.5	<0.5	<0.5	
	Reactive Sulfur (ppm)	<25	<25	<25	<25	<25	
	Flash Point (°F)	97	>140	>140	>140	>140	
	pH	6.63	7.31	7.12	7.46	7.67	
	Free Liquid (%)	0	0	0	0	0	1=1,00
	TPH (418.1) (ppm)	1510	1543	25,557	81,426	105,290	100
	DRO (8015) (ppm)	38	35	216	54	94	
	PCB's (ppm)	<2	<2	<2	<2	<2	
TCLP BNA	Cresols (ppm)	0.10	<0.02	0.13	<0.02	0.07	200
	1, 4-Dichlorobenzene	<0.02	<0.02	<0.02	<0.02	0.03	7.5
	2, 4-Dinitrotoluene	<0.02	<0.02	<0.02	0.04	<0.02	0.13
	Hexachlorobenzene	<0.02	<0.02	<0.02	0.05	0.02	0.13
	Hexachloro-1, 3-butadiene	<0.015	0.50	<.02	0.02	0.08	0.5
	Nitrobenzene	<0.02	<0.02	<0.02	<0.02	0.38	2
	Pentachlorophenol	0.07	0.07	<0.05	<0.05	0.10	100
	Pyridine	<0.05	<0.05	<0.05	<0.05	<.05	5
	2, 4, 5 Trichlorophenol	<0.05	<0.05	<0.05	<0.05	<.05	400
	2, 4, 6 Trichlorophenol	<0.05	<0.05	<0.05	<0.05	<.05	2
	Hexachloroethane	<0.02	<0.02	0.03	<0.02	0.05	3
TCLP VOLATILES	Benzene	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
	Carbon Tetrachloride	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
	Chlorobenzene	<0.05	<0.05	<0.05	<0.05	<0.05	100
	Chloroform	<0.05	<0.05	<0.05	<0.05	<0.05	6
	1, 2-Dichloroethane	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
	1, 1-Dichloroethane	<0.05	<0.05	<0.05	<0.05	<0.05	0.7
	2-Butanone (MEK)	<.5	<.5	<.5	<.5	<.5	200
	Tetrachloroethene	<0.05	<0.05	<0.05	<0.05	<0.05	0.7
	Trichloroethene	<0.05	<0.05	<0.05	<0.05	<0.05	0.5
	Vinyl Chloride	<0.05	<0.05	<0.05	<0.05	<0.05	0.2
TCLP METALS	Silver	<0.01	<0.01	<0.01	<0.01	<0.01	5
	Lead	<0.1	<0.1	<0.1	<0.1	1.0	5
	Cadmium	<.005	<.005	<.005	<.005	<.005	1
	Chromium	<0.05	<0.05	<0.05	<0.05	<0.05	5
	Aersenic	<0.001	0.003	0.008	<0.01	<0.001	5
	Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.2
	Baruim	1.5	<0.1	<0.1	23	15	100
	Selenium	0.0005	0.03	<0.002	<0.002	<0.002	1

5(a)

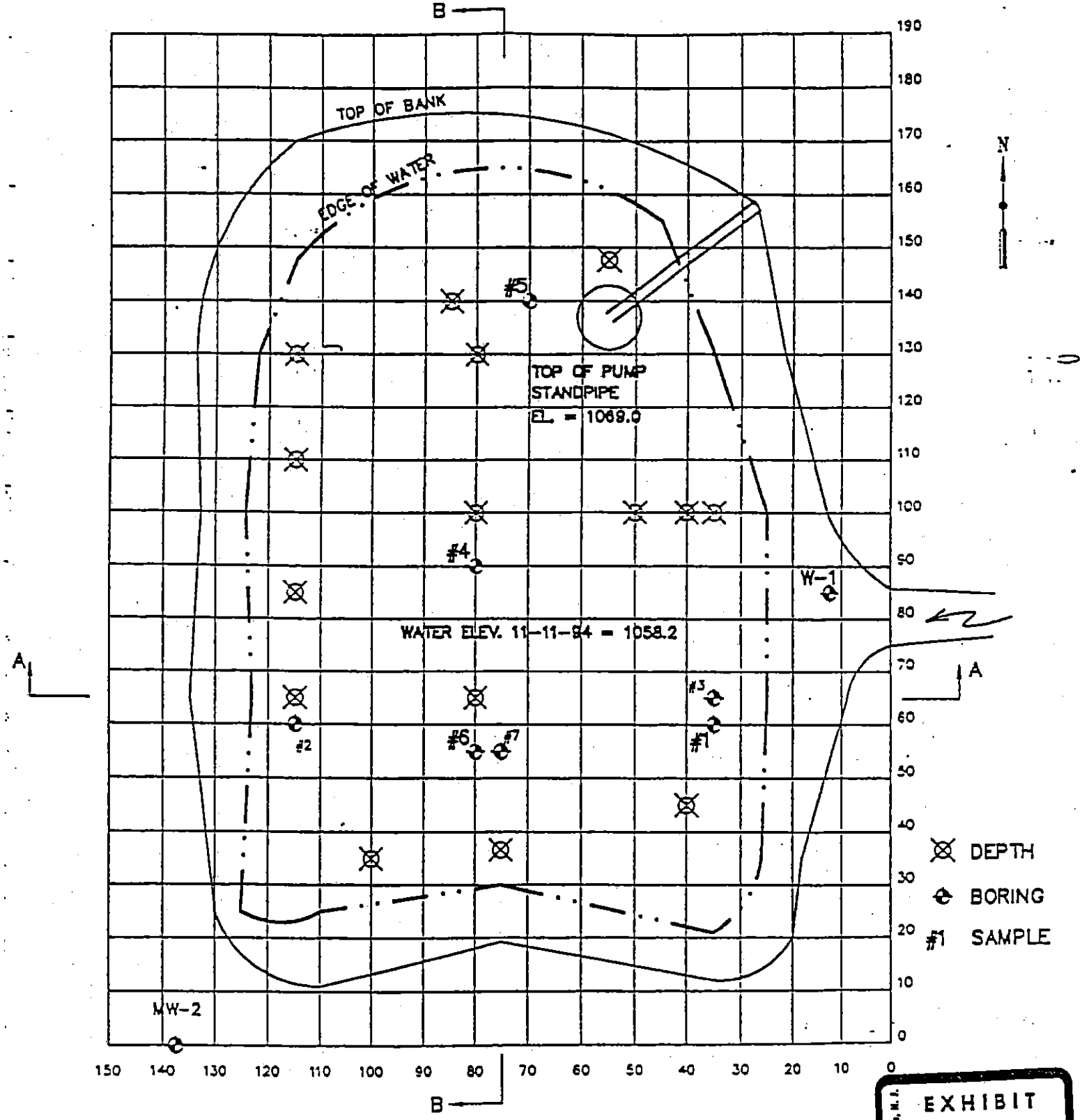


EXHIBIT #5 Defendant

SAMPLE LOCATIONS

W-1: FROM THE SIDEWALL, A GRAVELLY SAMPLE

1: THICK GREASE, ALMOST CLAY, COMPOSITE FROM 1.9' INTO MUCK AND 4.7' INTO MUCK

4: SOFY CLAY (BLACK) TO FAIRLY CLEAN GREASE (APPROX. 2.5' TO 4.0' BELOW MUCK)

5: DARK CLAY TO TAN CLAY 2.0' TO 2.5' BELOW MUCK

6: GREASE TO BLACK CLAY 2.0' TO 3.0' BELOW MUCK

CDF004159

6. Paint Filter Liquids Test - landfill requirements for solid wastes
7. PCB's - due to past detection (Governed under Toxic Substance Control Act) (TSCA)
8. Total Petroleum Hydrocarbons (TPH) - due to oil and grease contamination

TABLE 1: LAGOON #2 LAB ANALYSIS SUMMARY

Parameter / Sample #	1	2	3	4	5	6	7	Regulatory Limit
Reactive Cyanide (ppm)	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Reactive Sulfur (ppm)	<25	<25	<25	<25	<25	<25	<25	
Flash Point (°F)	>140	>140	>140	>140	100	<140	<140	
pH	7.65	7.77	7.47	7.73	7.77	5.88	5.88	
Paint Filter	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	
TPH (418.1) (ppm)	13,981	13,532	33,204	14,394	57,536	31,243	303,459	380
PCB's (ppm)	<2	<2	<2	<2	<2	<2	<2	
Cresols (ppm)	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	200
1, 4-Dichlorobenzene	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	7.5
2, 4-Dinitrotoluene	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	0.13
Hexachlorobenzene	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	0.13
Hexachloro-1, 3-butadiene	<0.02	0.50	<0.1	<0.02	<0.1	<0.1	<0.02	0.5
Nitrobenzene	<0.02	<0.02	<0.1	<0.02	<0.1	<0.1	<0.02	2
Pentachlorophenol	<0.05	<0.05	<0.25	<0.05	<0.25	<0.25	<0.05	100
Pyridine	<0.05	<0.05	<0.25	<0.05	<0.25	<0.25	<.05	5
2, 4, 5 Trichlorophenol	<0.05	<0.05	<0.25	<0.05	<0.25	<0.25	<.05	400
2, 4, 6 Trichlorophenol	<0.05	<0.05	<0.25	<0.05	<0.25	<0.25	<.05	2
Hexachloroethane	<0.02	<0.02	0.1	<0.02	<0.1	<0.1	<0.02	3
Benzene	<0.005	<0.005	<0.005	<0.02	<0.005	<0.005	<0.005	0.5
Carbon Tetrachloride	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.5
Chlorobenzene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	100
Chloroform	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	6
1, 2-Dichloroethane	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.5
1, 1-Dichloroethane	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.7
2-Butanone (MEK)	<0.01	<0.01	<.01	<.01	<.01	<.01	<.01	200
Tetrachloroethene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.7
Trichloroethene	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.5
Vinyl Chloride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	5
Lead	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	5
Cadmium	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	1
Chromium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	5
Aersenic	<0.001	0.001	0.001	<0.01	<0.001	<0.001	<0.001	5
Mercury	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.2
Barium	19.0	12	<0.1	20	19	4	<0.1	100
Selenium	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	1

Full Laboratory Analysis in Appendix B
Bold print in chart indicates samples exceeding regulated limits

EXHIBIT
#6
Defendant

2(b)
5(a)

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

4725 E. Sunrise Drive #412 Tucson, Arizona 85718 (602) 299-9808

EXHIBIT
#8
Defendant

January 6, 1995

Mr. Gene Hill
Hammontree & Associates, LTD.
5233 Stoneham Rd.
North Canton, Ohio 44720

RE: Bioremediation proposal to treat approximately 3000 cubic yards.

Dear Mr. Hill,

THE CRITTER COMPANY INC. (TCC) is pleased to submit this proposal for the bioremediation of contaminated soil at your site in Canton, Ohio. Our proposal is based on using naturally occurring microorganisms to breakdown the hydrocarbon contamination into harmless fatty acids, water, and carbon dioxide. TCC will augment the contaminated soil with microbes specifically selected for their ability to degrade petroleum. TCC will manufacture the microbial product in quantities required to treat the subject site. By controlling the manufacturing process, we insure that the plate count (microbes per gram) is maximized and degradation is accelerated.

Attached is a scope of work describing the proposed treatment process. If this proposal is accepted, TCC will bioengineer the system to address specific site conditions in detail.

This proposal is subject to the following:

TERMS & CONDITIONS:

1. A treatability study that shows our process will effectively degrade the contaminant.
2. This proposal is based on treating approximately 3000 cubic yards.
3. TCC will be responsible for the following:
    a. Treatability study.
    b. Bioengineering services.
    c. All site preparation for treatment.
    d. Labor and material for inoculating the soil.
    e. All earthmoving and watering during project.
    f. Reports and documentation procedure.

JAH

4. Hammontree & Associates is responsible for the following:
   a. Access to treatment area.
   b. Continuous water supply to the treatment area.
   c. Soil testing including beginning, intermediate, and confirmation samples upon completion of project.
   d. Permitting (If required).

PRICE QUOTATION: $69,000

1. Payment of $1,000 due upon acceptance of proposal.
2. 50% of balance ($34,000) due at time of first inoculation.
3. Remainder of balance ($34,000) due when the levels of contamination have reached closure levels.
4. Any substantial increase to the amount of contaminated soil will be billed at $23 per cubic yard.
5. Price quotation includes total cost for The Critter Company regardless of project length or number of treatments.
6. Price quotation good for 90 days (April 6, 1995).

If you have any questions or need additional information, please do not hesitate to call me at (614) 431-8190 or Jerry Coon at (602) 299-9808. If this proposal is acceptable, please sign and return one copy.

Sincerely,
THE CRITTER COMPANY, INC.

Scott Klingensmith

Scott Klingensmith
Project Coordinator

Accepted By: _____

Signature: _____

Title: _____

Date: _____

Exhibits: Scope of Work

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons
6890 E. Sunrise Drive, #120-10 Tucson, Arizona 85715 (520) 299-9808

26)

EXHIBIT #9 Defendant

April 28, 1995

Mr. Keith Houseknect
Canton Drop Forge
4575 Southway Street, S.W.
P.O. Box 6902
Canton, Ohio 44706

RE: Revised proposal for treating 9,000 cubic yards of sludge.

Dear Mr. Houseknect,

Pursuant to our conversation on Wednesday, April 26, 1995 and my conversation with Mr. Gene Hill of Hammontree & Associates on that same day, The Critter Company is proposing to biologically remediate sludge material found in lagoons 1 and 2. The Critter Company proposes to split excavating and bioremediation activities into two separate payment schedules for Canton Drop Forge. The Critter Company proposes the following:

PHASE I. (Excavating of material and building biocell)

1) The Critter Company will recommend an excavator to remove sludge from lagoons 1 and 2.

2) If necessary, the excavator will provide bonding to Canton Drop Forge.

3) The excavator will be paid directly by Canton Drop Forge for work completed.

PHASE II. (Bioremediation and maintenance of biocell)

1) The Critter Company will oversee construction of the biocell.

2) The Critter Company will inoculate the biocell and lagoon linings with microorganisms specifically grown and cultivated for this site.

3) The Critter Company will be responsible for all treatments and tilling of soil on a weekly or by-weekly schedule in the months of April-October.

4) The Critter Company will continue to treat until a composite sample reaches 380 ppm or less of total petroleum hydrocarbons.

5) The Critter Company will be paid by Canton Drop Forge based on performance of reducing contamination levels.

6) The Critter Company and Canton Drop Forge will mutually agree on a payment schedule based on reduction of contamination levels.

Environmental Resources, Inc. and our parent company, The Critter Company, Inc. appreciate this opportunity to bid. Environmental Resources is currently licensed to do business in the State of Ohio. If chosen as the bioremediation contractor on this project, The Critter Company will register with the State of Ohio. The Critter Company carries 2 million dollars of liability insurance. All of our treatment specialists are OSHA 40-Hour Health and Safety trained. If you have any questions or need additional information, please feel free to contact me at (614) 431-8190, or Mr. Jerry Coon in our corporate headquarters at (800) 483-4284.

Sincerely,
THE CRITTER COMPANY, INC.

Scott Klingensmith

Scott Klingensmith
Project Coordinator

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

2(b)

6890 E. Sunrise Drive #120-10 Tucson, Arizona 85715 (520) 299-9808

MEMORANDUM

To: Gene Hill

From: Jerry Coon

Date: September 20, 1995

Subject: Change Orders

1. Here are the requested changes we initially discussed in you office. We are again addressing the soil as one issue and the higher contaminant levels as the other. I have outlined two payment options. If you have other ones to suggest, please call me.

2. The money to be received upon execution of the changes reflects greatly increased costs to prepare for the project. I have had to alter my technique considerably from what I had initially planned on. I really have to treat what is in the cell as opposed to what we thought was in the cell. If we were to terminate the project at this time, I would anticipate preparing a statement for approximately $38,000 for work performed to date. Option 2 should be the most attractive as it closely ties our performance with our pay. Either is acceptable to me

3. Regarding the soil aeration, this Saturday we will try a "Bog Harrow" which will be delivered to the site from Kentucky. I am unfamiliar with this, as is Stan Evans, but I am told it will aerate to a depth of 18 inches and be impervious to the scrap metal which came from Lagoon #1. The Brown Bear aerator which we used is outstanding but is very expensive. Let's see how the Bog Harrow works and make a decision at that time.

4. We are experiencing difficulty in getting paid for work done to date. I know our attorneys have discussed this however a sixty day pay period on top of the lengthy bioremediation process is far excessive and needs to be changed. This is not part of their production process, is not classified as Cost of Goods Sold, and the money is set aside in escrow. Under normal conditions, this should be released immediately when the work is completed.

5. Again, call if you have some input or need clarification on these issues.

Jerry

CC: Scott Klingensmith

See Scott K LTR 9/28/95 did #5 & #6 Contract June 1 - initialed by J.C

EXHIBIT
#16
Defendant

CDF004165

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

6890 E. Sunrise Drive #120-10 Tucson, Arizona 85715 (520) 299-9808

2(b)

CHANGE ORDER

PROJECT	Canton Drop Forge 4575 Southway St., S. W. P.O. Box 6902 Canton, Ohio 44706	**CHANGE ORDER NUMBER: BIO-LAG 1-1** **DATE⇨ 09/19/95**
TO ENGINEER:	Hammontree & Associates 5233 Stoneham Rd. North Canton, Ohio 44720	

CONTRACT ORIGINALLY FOR: Bioremediation of oil contaminated soil from Lagoons #1 and #2.

The Contract is changed as follows: Pursuant to section 4.2.3 of the contract, The Critter Company, Inc. is requiring that this change order be approved.

1. Upon discovery by Beaver Excavation that debris was located in Lagoon # 1, and subsequently moved to the Bio Cell and as evidenced by visual observation by The Critter Company and as further evidenced by Mr. Larry Philyaw of Midwest Auger-Aerator (copy of letter attached and photographs taken by him available), the following change order is required.

2. All costs for soil aeration and movement during the bioremediation treatment from Lagoon # 1 shall be paid by Canton Drop Forge. Aeration shall be twice weekly by a method approved by The Critter Company but shall be paid directly by Canton Drop Forge to the contractor/equipment operator. As aeration is essential to a bioremediation project of this high contaminant level, aeration shall commence as soon as possible upon execution of this change order.

ACCEPTED BY:

Canton Drop Forge Hammontree & Associates The Critter Company **CDF004166**

By: Date:

By: Date:

By: Date: 9/20/95

SOIL AERATION (TILLING) WAS INCLUDED IN THE BID AND ORIGINALLY BID - NOW

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

6890 E. Sunrise Drive #120-10 Tucson, Arizona 85715 (520) 299-9808

2(b)
5(a)

CHANGE ORDER

PROJECT: Canton Drop Forge
4575 Southway St., S. W.
P.O. Box 6902
Canton, Ohio 44706

CHANGE ORDER NUMBER: BIO-LAG 1-2

DATE: 09/20/95

TO ENGINEER: Hammontree & Associates
5233 Stoneham Rd.
North Canton, Ohio 44720

CONTRACT ORIGINALLY FOR: Bioremediation of oil contaminated soil from Lagoons #1 and #2.

The Contract is changed as follows: Pursuant to section 4.2.3 of the contract, The Critter Company, Inc. is requiring that this change order be approved.

1. Upon confirmation from Hammontree & Associates, LTD, contamination levels of the material from Lagoon # 1 were on average three times the levels reported to The Critter Company (TCC) in analytical reports prepared by Hammontree & Associates, LTD. (Hammontree) prior to TCC bidding this project. Due to the extremely high contamination levels, TCC requires that the price to continue treating the 3000 cubic yards in the Bio-Cell be increased to $26 per cubic yard.

2. Due to the high contamination levels in the Bio-Cell, TCC cannot be responsible for completing this project in two years. However, TCC will continue to treat the soil in the Bio-Cell until target levels are reached.

3. This change order is only for the 3,000 cubic yards in the Bio-Cell and is contingent upon acceptance of Change Order #BIO-LAG 1-1 and #BIO-LAG 1-2.

4. TCC has and will continue to manufacture microbes and treat the Bio-Cell while these change orders are reviewed and approved.

CDF004167

ORIGINAL: $12.00/CY x 3000 CY = $36,000

REVISED: $26.00/CY x 3000 CY = $78,000

217% INCREASE!

(The total effect will likely be a 300% increase)

WHY SHOULD PAYMENT SCHEDULE CHANGE?

PAYMENT SCHEDULE

One of the following payment schedule Options is required due to the increase in contamination levels resulting in anticipated increases in clean-up time, increases in production and labor costs and increases in research and development required to handle the difficulty of the contaminant and the site.

OPTION 1.

1. $4,800 (Billed July 26, 1995) to be paid immediately.
2. $21,000 due upon acceptance of this change order.
3. Three monthly payments of $7,000 due October 30, 1995, November 30, 1995 and December 30, 1995.
4. Balance due of $36,000 when levels of contamination reach target levels as specified in Bid Specifications. (Net 20 days)

OPTION 2.

1. $4,800 (Billed July 26, 1995) to be paid immediately.
2. $25,000 due upon acceptance of this change order.
3. 40% of balance (Lagoon #1 only) due when contamination levels have dropped to 25% of original levels. Net 20 days.
4. 25% of balance (Lagoon #1 only) when contamination levels have dropped to 50% of original levels. Net 20 days.
5. 25% of balance (Lagoon #1 only) when contamination levels have dropped to 75% of original levels. Net 20 days.
5. Remainder of balance (Lagoon #1 only) due when contamination levels have reached target levels. Net 20 days.

EXPIRATION DATE: September 30, 1995

As time is of the essence to continue treatment prior to colder temperatures, should this change order not be executed by the expiration date, TCC will submit a statement for work performed to date pursuant to Ohio Statutes.

ACCEPTED BY:

Canton Drop Forge	Hammontree & Associates	The Critter Company
By:	By:	By: Jerry Com Pres.
Date:	Date:	Date: 9/20/95

MIDWEST AUGER-AERATOR

2(b)

September 5, 1995

Jerry Coon
Critter Co.
6890 E. Sunrise Dr.
#120-10
Tucson, AZ

Dear Jerry:

After visiting the job site at Canton, I would agree that the Brown Bear would definitely be the best tool for this project, but because of the extremely harsh working environment, I am quite concerned about damage to the machine. I am enclosing some photos we took of just a few items that can ruin tires, bend/break the auger, and take out the auger drive bearings and seals. We found numerous rocks and chunks of concrete large enough to do such damage. In addition, there are all kinds of metal stakes, shards, plate stock, I-beams, etc., plus cable that will wrap up on the auger and destroy seals and bearings.

You can expect extraordinary costs of operation due to these hazards, but it is difficult to tell you what to budget, because the extent of damage will be in direct relationship to how well the material is purged of these items before the Bear works there, and how careful the operator is in stopping and removing these items the instant they are turned up by the auger. Even without the extra damage, you will also have accelerated wear to the auger components due to the highly abrasive nature of the material.

We can rent you a Bear for this job for $12,500 per month f.o.b. Pontiac, IL, and would also need a $10,000 damage repair deposit to be applied toward the cost of any repairs the machine would need upon its return to our shop, to bring it back to the same condition as when it left, except for normal wear and tear. Additionally, the first month's rent and damage deposit must be received prior to shipment of the machine from our yard, and each subsequent month's rent is due at the start of the rental month. The rental period is from when the machine leaves our yard until it is returned, and upon the return inspection, any repairs needed will be paid for out of the $10,000 deposit, with any balance being returned, or any additional being billed out. The machine is rented on a net net basis, meaning all operating costs and all repairs of any nature are the responsibility of the lessee.

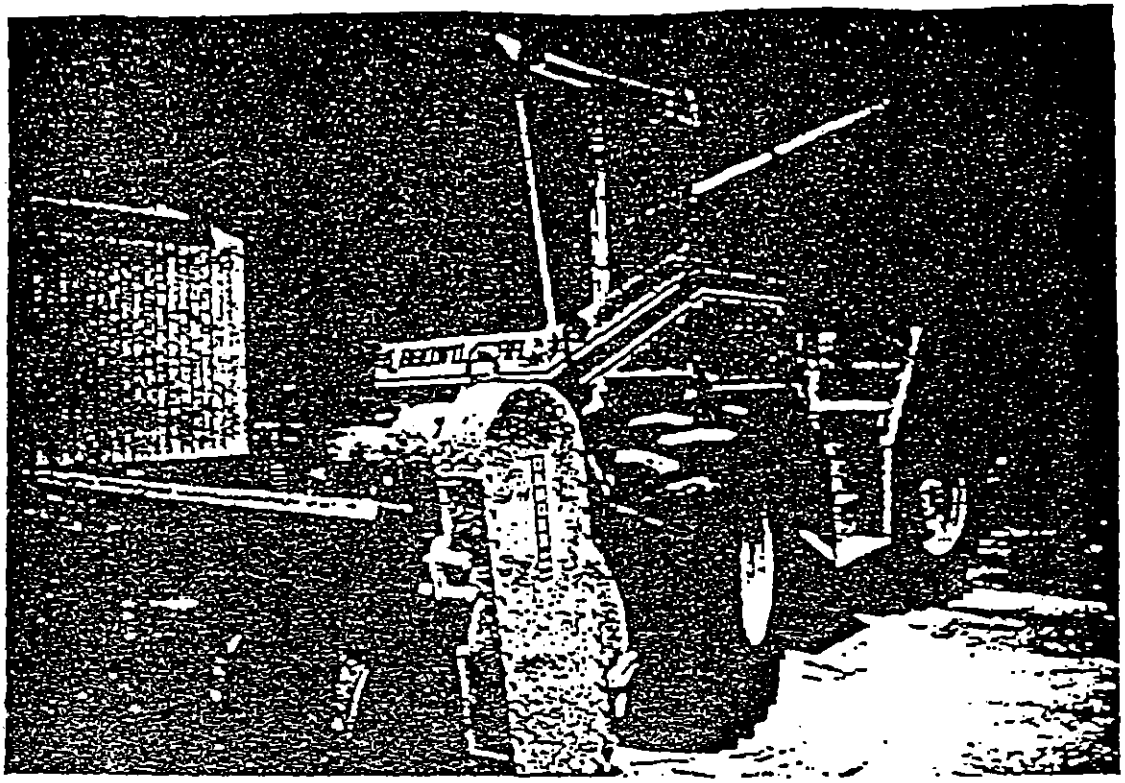
Our normal option to purchase the machine is to allow 100% of the rentals paid in, to apply to the purchase price of $79,500, if the unit is purchased within the first 30 days of the rental contract, or 90% if purchased within 90 days. Of course, if the purchase option is exercised, the $10,000 damage repair deposit would also be applied to the selling price.

As for giving you some idea of what various costs might be, a set of 28.1-26 L1 tires will run about $5000, an auger screw rebuild (wear plates, carbide teeth, hard facing, welding, etc.),will run $2000-3000, auger bearings about $1000-2000, and auger shaft replacement $2000-3000. You may or may not have to bear these costs, as mentioned above, but I think I would allow something, especially enough for a set of tires and screw rebuild.

If you need any further information, please don't hesitate to call.

Sincerely,

Larry Philyaw
MIDWEST AUGER-AERATOR



BROWN BEAR I

STOCK # 1062

$79,500

225 HP Brown Bear I w/10' Auger w/carbide cutting teeth. JD 6466A Diesel Engine. ROPS Cab w/Heater and Air Conditioning. Four Wheel Drive, Four Wheel Steering, with coordinated, crab & front-wheel-only steering modes. 28.1-26 L1 Forestry Tires, 75-80% Tread Remaining.

Machine completely rebuilt approximately 1500 hours ago, including hydraulic pumps & motors, differentials & axles. Recently gone through in shop, all systems checked, tested, & serviced or repaired as needed.

Available August 15, 1995. 30 day 50/50 warranty. Rent-purchase plan available.

RENTAL RATES: $12,500/MO. 1 MO. MIN.
10,000/MO. 3 MO. MIN.
8,500/MO. 6 MO. MIN.

AAA

MIDWEST ROGER-AERATOR

1-800-3294

CDF004171

K-D

2(b)

R. JAMES HAMMONTREE, P.E., P.S.
BRUCE M. BAUR, P.E., P.S.
LAWRENCE D. PHILLIPS, P.E., P.S.
CHARLES F. HAMMONTREE, P.E., P.S.
RONALD P. DOHY, P.S.
GARY L. TOUSSANT, P.S.
JOSE E. TOLEDO, P.E., P.S.
RICHARD R. COOK, P.E., P.S.
JAMES C. BOLLIBON, P.E., P.S.
KEITH A. BENNETT, P.E., P.S.
BARBARA H. BENNETT, P.E., P.S.

HAMMONTREE & ASSOCIATES, LIMITED
Consulting Engineers · Planners · Surveyors

TREEMORE BUILDING
5233 STONEHAM ROAD
NORTH CANTON, OHIO 44720

PHONE (216) 499-8817
FAX (216) 499-0149
TOLL FREE 1-800-394-8817

MICHAEL L. DECKER, P.E.
RICHARD J. FAULHABER, P.E., P.S.
GREGORY E. MENCER, A.P.A.
DANIEL J. GRINSTEAD, P.E.
MARK E. FRANZEN, P.E.
KARL J. OPRISCH, P.E.
JEFFREY L. SPRAY, P.S.
PAUL A. TOMIC, P.S.
WILLIAM N. CLARK, P.E., P.S.
THOMAS J. KING, P.S.
DOMINIC A. MARTUCCIO, P.E., P.S.
PAUL K. MILLER, P.S.
DAVID T. MILLER, P.S.

October 2, 1995

The Critter Company
6890 East Sunrise Drive #120-10
Tucson, Arizona 85715

Attention: Jerry Coon

Subject: **Change Order requests**
dated September 20, 1995
Change Order Number: BIO-LAG 1-1
Change Order Number: BIO-LAG 1-2
Payment Schedule

Prior to responding to your change order request I will review the current contract agreement. The Critter Company (TCC) and Canton Drop Forge (CDF) entered into in agreement in June of 1995, for bioremediation services. Under this contract TCC's responsibilities included the following:

1. Treatability study
2. Bioengineering services
3. All site preparation necessary for treatment; including coordination of bio-cell construction.
4. Labor and material for inoculating the material to be treated.
5. All earthmoving and watering during the duration of the project, including weekly or bi-weekly tilling of bio-cell material.
6. Reports and documentation procedure.
7. Permitting

w:\rene\letter\coon2

EXHIBIT
#17
Defendant

CDF and Hammontree & Associates, Ltd. (H&A) are responsible for:

1. Access to the treatment area (CDF).
2. Continuous water supply to the treatment area (CDF).
3. Soil sampling and testing including beginning, intermediate, and confirmation samples upon completion of the project (H&A)

We have reviewed and discussed the change order request with CDF. The following sections will address each item in your September 9, 1995 letter in order.

CHANGE ORDER - BIO-LAG 1-1, ITEM 1

The occurrence of scrap metal and debris at a forge company should have been expected and should not come as a surprise. TCC personnel were able to visit the CDF property including Lagoon #1 and the bio-cell site. In fact CDF personnel drew attention to the probable presence of such material to TCC.

TCC is considered the expert in determining the suitability of materials for bioremediation. As indicated by TCC, two factors which determine the suitability are the biodegradability of a material and the physical make up of a material. The investigation of these items was TCC's responsibility.

Based on these items, CHANGE ORDER BIO-LAG 1-1, ITEM 1 is rejected.

CHANGE ORDER - BIO-LAG 1-1, ITEM 2

In the January 6, 1995, letter from TCC to H&A it is clear that TCC intended to be the party responsible for all earthmoving and watering during the project. In the report title "Lagoon #1 Sludge Disposal/Treatment Options", page 4 lists tilling of the bio-cell as part of TCC's responsibilities. This statement was included in the report as a result of your January 6, 1995 letter. The Critter Company received a copy of this report and was aware of each parties responsibilities during the project.

An April 28, 1995 Critter Company's letter also acknowledges TCC as the party responsible for tilling of the bio-cell.

Items 5 and 6 in the April 28, 1995 Critter Company letter indicate TCC's acceptance of performance based payments and the need for a mutually agreeable payment schedule. As requested by TCC and agreed to by Canton Drop Forge, payments based on performance were used in lieu of performance bond which you could not or would not provide.

Direct payment to an "aeration contractor" is not acceptable. The tilling is included in the bid price of $12/c.y. as listed on page 13 of the contract.

CHANGE ORDER: BIO-LAG 1-2, ITEM 1

In the January 6, 1995, letter from TCC it is clear that TCC will be responsible for the treatability study required for the project. Nowhere in that letter does it indicate that Hammontree & Associates or Canton Drop Forge was responsible for determining treatability. Hammontree & Associates is responsible for beginning, intermediate, and confirmation samples. Hammontree did retrieve and test materials lining Lagoon #1 as part of the preparation of "Lagoon #1 Sludge Disposal Treatment Options". As indicated on page 1 of that report the intent of that investigation was to determine whether the material was hazardous and/or biodegradable. This goal was met. Nowhere in this report does it indicate that the samples tested were representative of the average material. During sample retrieval attempts were made to pass through the bulk of the obviously contaminated material and into a "clean" layer to determine the physical limits of contamination and aid in treatment quantity estimation.

TCC was given samples of both the lining material and the material from the center of the sludge layer. TCC did not test these samples for TPH.

It was TCC's responsibility to verify contamination levels. Page 4 of "Lagoon #1 Sludge Disposal/Treatment Options" does indicate that Hammontree & Associates is to sample as required by TCC during remediation, however, Page 1 of Contract 95-2A states that initial contamination concentrations shall be established by five (5) random samples from the bio-cell material.

CHANGE ORDER: BIO-LAG 1-2, ITEM 2

The time frame shall be as stated in the contract documents. Altering the completion of work date is not acceptable to CDF.

CHANGE ORDER: BIO-LAG 1-2, ITEM 3

No comment required since Items 1 and 2 are not acceptable to CDF.

CHANGE ORDER: BIO-LAG 1-2, ITEM 4

No comment required. TCC is expected to conform to the contract documents.

PAYMENT SCHEDULE

There is no justification for altering the payment schedule. The payment schedule in Contract 95-2A is very clear and mutually agreed upon. This type of payment schedule was requested by TCC in lieu of a performance bond. The only payments that fall outside of this schedule will be for work that is not covered in the contract document.

Also, I am requesting that five feet of clearance be maintained between the bio-cell material and the existing monitoring well. This was agreed to in preliminary bioremediation discussions.

Sincerely,

HAMMONTREE & ASSOCIATES, LIMITED

Gene G. Hill, E.I.T., M.S.

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

4725 E. Sunrise Drive #412 Tucson, Arizona 85718 (602) 299-9808

2(b)

January 6, 1995

Mr. Gene Hill
Hammontree & Associates, LTD.
5233 Stoneham Rd.
North Canton, Ohio 44720

RE: Bioremediation proposal to treat approximately 3000 cubic yards.

Dear Mr. Hill,

THE CRITTER COMPANY INC. (TCC) is pleased to submit this proposal for the bioremediation of contaminated soil at your site in Canton, Ohio. Our proposal is based on using naturally occurring microorganisms to breakdown the hydrocarbon contamination into harmless fatty acids, water, and carbon dioxide. TCC will augment the contaminated soil with microbes specifically selected for their ability to degrade petroleum. TCC will manufacture the microbial product in quantities required to treat the subject site. By controlling the manufacturing process, we insure that the plate count (microbes per gram) is maximized and degradation is accelerated.

Attached is a scope of work describing the proposed treatment process. If this proposal is accepted, TCC will bioengineer the system to address specific site conditions in detail.

This proposal is subject to the following:

TERMS & CONDITIONS:

1. A treatability study that shows our process will effectively degrade the contaminant.
2. This proposal is based on treating approximately 3000 cubic yards.
3. **TCC will be responsible for the following:**
   a. Treatability study.
   b. Bioengineering services.
   c. All site preparation for treatment.
   d. Labor and material for inoculating the soil.
   e. All earthmoving and watering during project.
   f. Reports and documentation procedure.

4. **Hammontree & Associates is responsible for the following:**
   a. Access to treatment area.
   b. Continuous water supply to the treatment area.
   c. Soil testing including beginning, intermediate, and confirmation samples upon completion of project.
   d. Permitting (If required).

PRICE QUOTATION: $69,000

1. Payment of $1,000 due upon acceptance of proposal.
2. 50% of balance ($34,000) due at time of first inoculation.
3. Remainder of balance ($34,000) due when the levels of contamination have reached closure levels.
4. Any substantial increase to the amount of contaminated soil will be billed at $23 per cubic yard.
5. Price quotation includes total cost for The Critter Company regardless of project length or number of treatments.
6. Price quotation good for 90 days (April 6, 1995).

If you have any questions or need additional information, please do not hesitate to call me at (614) 431-8190 or Jerry Coon at (602) 299-9808. If this proposal is acceptable, please sign and return one copy.

Sincerely,
THE CRITTER COMPANY, INC.

Scott Klingensmith

Scott Klingensmith
Project Coordinator

Accepted By: _____

Signature: _____

Title: _____

Date: _____

Exhibits: Scope of Work

THE CRITTER COMPANY
Biological Remediation of Hydrocarbons

6890 E. Sunrise Drive, #120-10 Tucson, Arizona 85715 (520) 299-9808

GGH

RECEIVED
JUN 6 1995
CANTON DROP FORGE

June 2, 1995

Mr. Gene Hill
Hammontree & Associates, LTD.
5233 Stoneham Rd.
North Canton, Ohio 44720

RE: Canton Drop Forge Bioremediation Project.

Dear Gene,

The following is a response to your comments and questions regarding the Canton Drop Forge bioremediation project as outlined in your letter on May 19, 1995.

1. TIME FRAME:

A. To better serve Canton Drop Forge, The Critter Company has already designed and manufactured over 200 lbs. of oil eating microbes to start this project. Additional microbes will be grown on-site throughout the duration of the project.

B. Upon signing of the contract, The Critter Company will have Beaver Excavating build the Bio-Cell. This will take 2 to 3 days. Work can commence within 5 days of signing of the contract.

C. The Critter Company will then seed the bottom of the Bio-Cell with nutrients and oil eating microbes prior to any material from Lagoons 1 or 2 entering the cell. Beaver Excavating will then proceed to excavate sludge material from Lagoon 1, transport material to the Bio-Cell, and spread it out over the Bio-Cell. It will take approximately 2 weeks to build the Bio-Cell and completely empty Lagoon 1.

D. If additional space exists in the Bio-Cell, The Critter Company, with permission from Canton Drop Forge, will have Beaver Excavating transport the material from Lagoon 2 into the Bio-Cell until it has reached full capacity. The Critter Company and Beaver Excavating estimate that no more than 4,500 cubic yards will fit into the Bio-Cell. Contaminated soils will be spread throughout the Bio-Cell at a depth of 18-22 inches. A 3 foot dike will be constructed around the entire cell to prevent run-off.

2. WORK PLAN & SCHEDULE:

A. Pumping - The Critter Company asks that Canton Drop Forge remove as much of the water from Lagoons 1 and 2 out as possible prior to Beaver Excavating removing sludge material.

B. Rain - Unless several inches of rain falls within a 24-48 hour period, we do not foresee weather adversely affecting removal of sludge.

C. Layout of Bio-Cell - The layout and location of the Bio-Cell will be dependent upon how much land can be allocated by Canton Drop Forge for this project. The Critter Company will ask Keith Houseknect or an other representative from Canton Drop Forge be on-site during the building of the Bio-Cell in order to mark boundaries for the excavation crew. Currently, several large pieces of CDF equipment occupy the space where the Bio-Cell will be constructed. Therefore, The Critter Company cannot outline the exact boundaries of the cell at this time. However, it is our understanding from Keith Houseknect that the cell can be constructed around each piece of equipment.

D. Time Frame:

-2 Weeks to build Bio-Cell and empty Lagoon 1 and part of Lagoon 2.
-Bioremediation treatments will be made approximately once a week.
-Tilling or turning over soil will be done approximately once a week.
-Sampling will be conducted once a month by Hammontree & Associates.
-Treatment process for the first 4,500 cubic yards should take between 3-6 months of warm weather.
-The second 4,500 cubic yards will follow the same schedule.

3. PERMITTING: Permitting will not be necessary for the bioremediation portion of this project.

4. BULKING: While The Critter Company does not anticipate to bulk any sludge material with native soils, we will need to add between 1/2 - 1 1/2 tons of a fertilizer and nutrient mixture.

5. SAMPLING AND ANALYSIS: The Critter Company requests that the EPA 418.1 method be run in conjunction with a GC method. We have two concerns about the 418.1 method. First, this method has a long history of yielding unpredictable and unreliable results. The Critter Company can provide documentation of the problems surrounding 418.1. Second, this method is expected to be abolished before the end of this project.

NOTE: SAMPLE USED FOR BID WAS 418.1

If you have any questions or need additional information, please do not hesitate to call me at (614) 431-8190 or Jerry Coon at (520) 299-9808.

Sincerely,
THE CRITTER COMPANY, INC.

Scott Klingensmith

Scott Klingensmith
Project Coordinator

ZURN Hydromechanics Div.

2(b)

Note to File
Re: Lagoon #1 Remediation
2/6/96

I found a number of old pictures today which show areas of the 3 lagoons. They were taken in 1992

Forgings, Brick, Concrete, Pallets, tree limbs, large rocks are evident although the pictures were not for that purpose and I remember outcroppings that were more extream ie to the south of the inlet on Lagoon #1 (South end - corner)

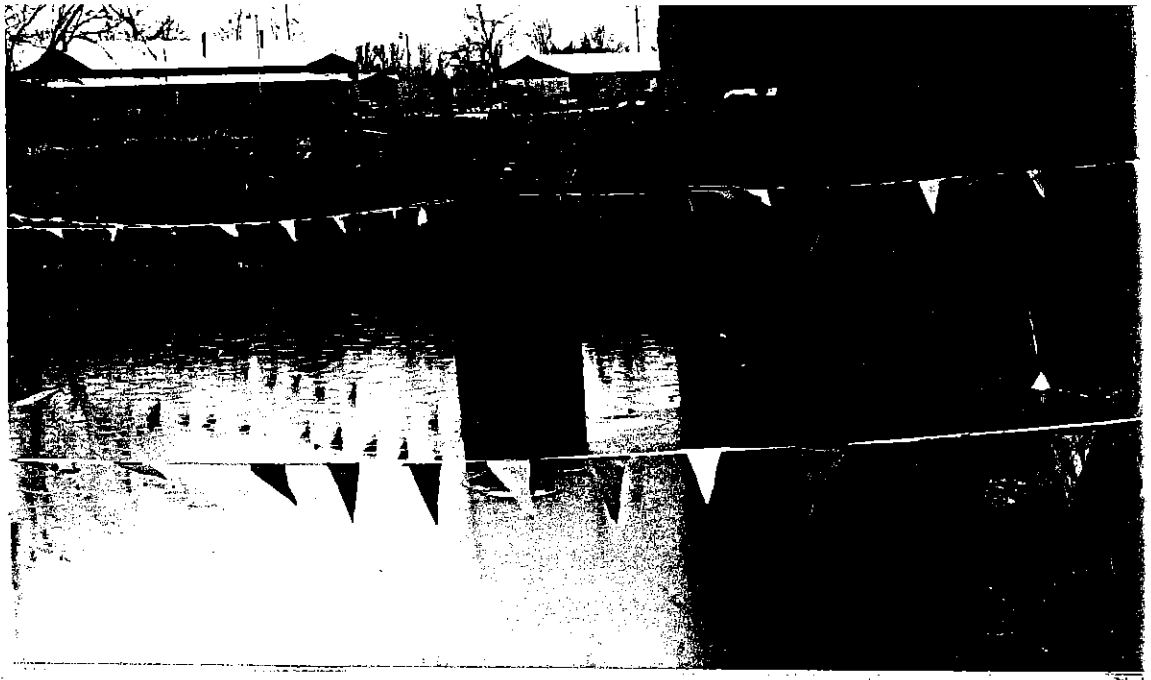
J. CURTISS & ASSOCIATES
524 Parkway View Drive
Pittsburgh, PA 15205
Phone: 412/788-1550
Fax: 412/788-1555

2(b)

BRICK

ROCKS

BOARDS



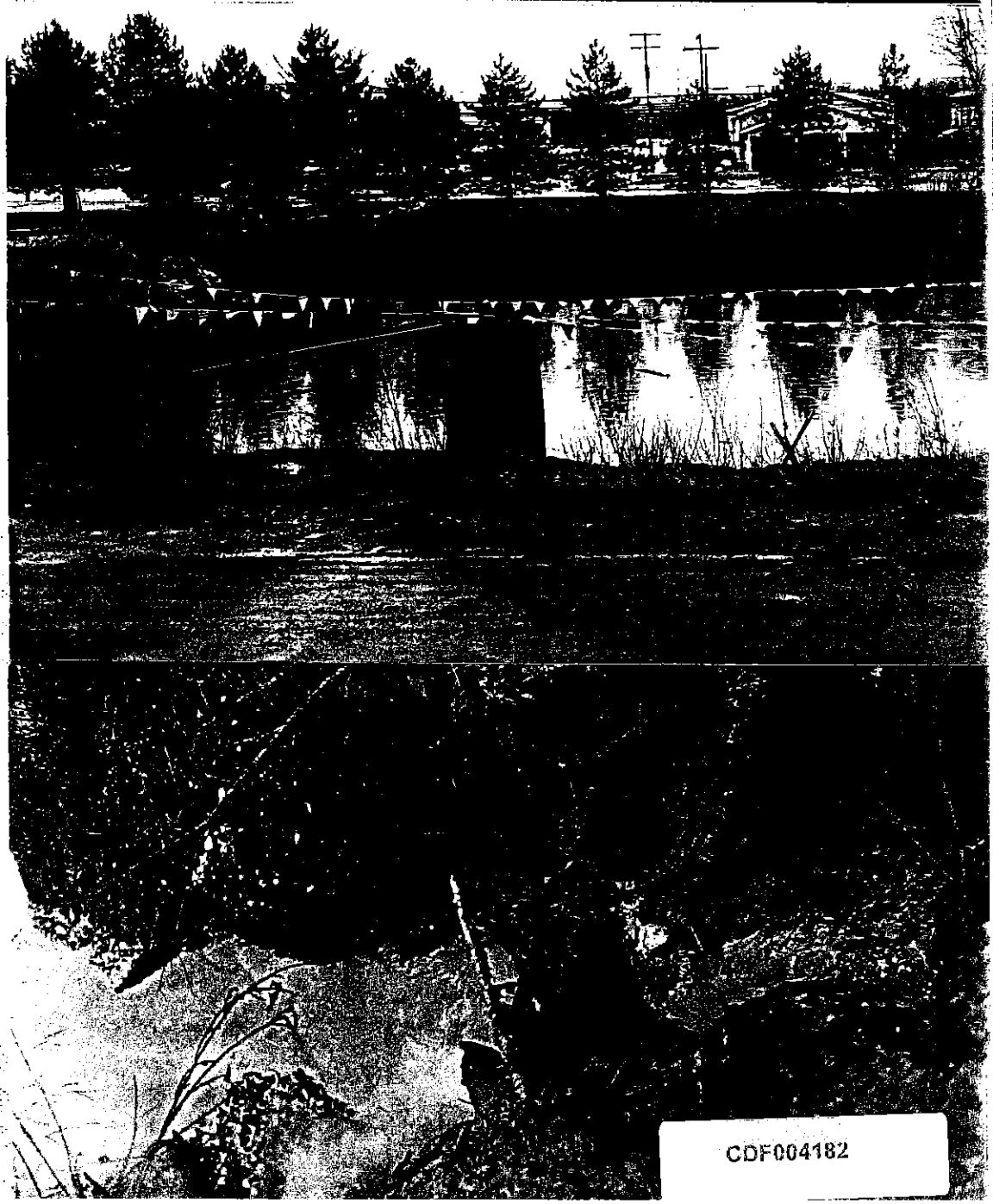
BRICK

CONCRETE

OUT CROPPINGS

WOOD

METAL STAKES



FORGINGS

STEEL BAR

CDF004182

2(b)

THE BIOREMEDIATION PROCESS
A Practical Guideline

The following information is provided by THE CRITTER COMPANY, INC. (TCC) as an overview of the science of bioremediation. The information presented is taken from our experiences and from information provided by Dr. Carl Oppenheimer, the microbiologist affiliated with TCC.

Bioremediation is based on the concept that nature provides a mechanism for naturally recycling all organic material. Applied microbial bioremediation helps nature along by isolating specific organic degrading microbes, cultivating a large quantity and introducing them to the contaminated medium with proper amounts of nutrients and oxygen to dramatically accelerate the degradation process.

Applied microbial bioremediation can use either naturally occurring microbes or genetically engineered microbes (GEM's) or pathogens. ***The Critter Company and this article only deals with naturally occurring microbes.***

The Microbe:

Bacteria are the earth's primitive single celled organisms. Their basic role is to recycle the components of living organisms, converting them to the nutrient chemicals used by plants in photosynthesis and chemosynthesis. The bacteria have an average size of one micron, a 10,000th of a centimeter or 25,000th of an inch. More than 3000 species of bacteria have been identified and many more that are still unknown.

Their size makes the microbe one of the smallest living units that contain the necessary complex chemicals for life processes and the necessary enzymes for their role in recycling complex organic matter. These small cells, by design, have large surface to volume ration which permits a maximum cell wall chemical activity and interchange of materials unto and out of the cells.

Each molecule that is produced by life is decomposed either during metabolism of higher organisms including plants, or recycled by microorganisms. The goal of nature's recycling is due to release their elements back to the inorganic components, to be utilized again by plants and animals.

The design of our earth and living forms has a balance, or equilibrium, dictated by the laws of physics and chemistry, geological structures and the composition of plants and animals. The microbe fits into this balance by its small size, great tolerance for variations of temperature, water availability, concentration of materials, and the necessary enzymes to recycle all the 6 million chemical organic compounds produced as a part of life.

Distribution in Nature:

Since the primary responsibility of microorganisms is to recycle organic material, and since the total biological protoplasm is relatively constant for any ecological system, bacteria of a wide variety of species must be present in sufficient quantities and diversity in all environments to recycle the organic material, both natural and man made.

Bacteria, because of their small size are readily distributed throughout the earth's surface. They are transferred by wind into the atmosphere to heights of 80,000 feet in dust, in water currents carry microbes into the deepest ocean channels. Microorganisms have been found at the base of the deepest oil wells. It is estimated that an adult human may have as many as 3 pounds of bacteria on the skin and internal organs. These organisms continuously add to the surrounding environment.

Microorganisms have many other properties that characterize their role as mineralizers. They have an ability to form resting cells in times when food is not available. When environmental conditions become favorable, these resting cells can rapidly infiltrate the environment to fulfill their basic role in recycling organic matter. In soils, microorganisms are readily transported by water movement over long distances both down and through geological formations. In fact much of the weathering of rocks and soils are carried out by microbial activities. Oil, gas, and coal are the products of living organisms trapped in geological formations.

The patterns of the distribution of soil and water microorganisms are more complex than stated above. However, one can realize that nature developed a tremendous capability of producing and continually distributing a large population of these small very active and mobile single celled organisms. The microbes have the basic responsibility to restore the environment wherever natural or man made pollutants are in excess. When pollutants are in excess of natural microbial recycling, the bacteria will continue to work but take longer than man is willing to wait. For this state of unbalance, man has coined the word, "Pollution".

Bioremediation:

Applied Microbial Bioremediation is a relatively new term used to describe the enhanced recycling of human, industrial, and agricultural wastes. The natural process can be accelerated by the application of selected microbial populations designed to supplement the natural microorganisms and thus direct their activity.

Applied Microbial Bioremediation therefore is a process where massive numbers of selected microorganisms are introduced into contaminated soil or water. The organisms are carefully selected for their ability to degrade contaminated materials to harmless by-products and to use this process for growth and energy. These microorganisms will supplement and associate with indigenous microorganisms and through the proper application, the versatile mixture can materially enhance the normals cycles present in the environment.

Bioremediation with such specially selected mixtures of microorganisms can be used in-situ, in special reactors, and on surface water or soil. The application methodology is dictated by the conditions of the general ecology of the area and the chemistry and concentrations of the contaminated material to be recycled.

Application:

Obviously, because of the many complex interrelationships between microorganisms and their environment, each site requires a separate approach. The primary objective is to bring an inoculant of specific microorganisms, water, oxygen, and nutrients into contact with the contaminated material.

For microbial enzymes to be functional, there must be a contact between the microbe cell and the hydrocarbon molecule. The bioengineering of any site selected must include a place at the atomic level, at the interface between microorganisms and surfaces. The atomic oxygen is very difficult to measure. Evidence of activity is generally determined by an increase in biological activity.

In the presence of the biocatalyst, microbial populations exceed those produced by normal oxygenation and nutrients. Laboratory and field tests show a thousand fold increase in cell mass of microorganisms cultivated in the presence of the biocatalyst. In addition, there is laboratory evidence that the biocatalyst accelerates growth in minimal oxygenated media. Aerobic growth can proceed at a more rapid rate suggesting that oxygen is available.

The biocatalyst in sediments could produce micro amounts of available atomic oxygen even under anaerobic conditions. This effect may be responsible for the successful use of facultative aerobes in microbial enhanced oil recovery where our microorganisms with catalyst was effective in increasing the yield of many low producing oil wells.

The use of an oxygen producing biocatalyst opens a new era of applied bioremediation in ground water and soil where oxygen is at a minimum.

Toxicity:

Toxic materials include inorganic or organic compounds that will kill or inhibit a part or all of the microorganisms. The complexity of the environment requires a compatibility test for each application.

Temperature:

Microorganisms are active in temperatures from freezing to 130 degrees fahrenheit. Normally, activity is closely related to temperature increases. There is evidence that biological activity is stimulated by infrared radiation. In some cold environments, it is possible to increase the biological activity by modifying a greenhouse effect.

Summary:

The rate of bioremediation will be relative to the concentration of hydrocarbons in the original site and the ability to provide optimal environmental conditions for microbial growth. Applied bioremediation does not consist only of the addition of microorganisms or the addition only of nutrients. The total environmental system, as related to the size and properties of the microbial amendment, must be considered. If any of the four basic requirements listed above are missing, then the process will not be efficient or may not take place. In addition, other properties such as soil types, soil chemistry, organic content, toxic materials, temperature, etc., are also important parameters, and as such must also be considered. Bioremediation is an efficient and cost effective way to treat contaminated soils and groundwater. The key is to understand the microbiology and geology of the site and design an inoculant and distribution system to account for those conditions.

MICROBIAL BIOCATALYST

The following presents a discussion of the biocatalyst taken from an article by Dr. Carl Oppenheimer in June 1992 entitled, "Applied Microbial Bioremediation., A practical Guideline."

A catalyst is a compound which in small amounts accelerates a chemical reaction without being consumed in the process. A biocatalyst is a substance that initiates or modifies the rate of a biological process and is generally consumed in the process.

The Oppenheimer Biocatalyst is a third generation product originating from the original "Martin Formula". The material is derived completely from the natural materials and has been shown in many different applications throughout the years to stimulate biological activity. There are certain observations, during the use of this biocatalyst, that suggests it is interrelated with the availability of oxygen. We are familiar with the uptake of hydrogen and the catalytic influence of metals such as iron on the conversion of molecular hydrogen to atomic hydrogen. This is the basis for cathodic protection of iron. Is it possible that oxygen can be catalytically transferred from the water molecule to atomic oxygen on surfaces, at which time the oxygen would be almost instantaneously oxidized or be available at cellular surfaces? This reaction could take place at the atomic level, at the microscopic interfaces between microorganisms and surfaces. This atomic oxygen is very difficult to measure. Evidence of activity is generally determined by an increase in biological activity.

In the presence of the biocatalyst, microbial populations exceed those produced by normal oxygenation and nutrients. It is possible that because of the physics of normal mechanical aeration (bubbles) in water, there is a microsphere of area between the bubbles where dissolved oxygen is very low. If so this could account for the thousandfold increase in cell mass of microorganisms cultivated in the presence of the biocatalyst. In addition, there is laboratory evidence that the biocatalyst accelerates growth in minimal oxygenated media. Aerobic growth can proceed at a more rapid rate suggesting that oxygen is available. Thus a facultative anaerobic culture will continue to function as an aerobe even with the minimal concentration of molecular oxygen.

The biocatalyst in sediments could produce micro amounts of available atomic oxygen even under anaerobic conditions. This effect may be responsible for the successful use of facultative aerobes in microbial enhanced oil recovery where our microorganisms with catalyst was effective in increasing the yield of many low producing oil wells.

In the process of evolution from an anozic to an oxic world, living microorganisms changed from an environment without molecular or gaseous oxygen to an oxygen rich environment. It is believed, as relating to present day anaerobic microbial processes, that oxygen was available from the reduction of oxygenated chemicals such as nitrate or sulfate. However, it is doubtful whether the solidification of molten materials making up the earth's surface in the absence of molecular oxygen resulted in oxygenated minerals such as sulfates or nitrates capable of releasing oxygen by reduction to then be used for metabolism. This would imply that the earliest forms of simple microorganisms must have had some other source of oxygen for growth and metabolism.

One source of reactive oxygen present in the primitive earth surface was the water molecule. In photosynthesis, oxygen from water is converted to molecular oxygen. Is there a possibility that in the early evolution of life, oxygen was available at the atomic level as a result of a catalytic conversion of water? This phenomenon would explain how early life forms were active some 3.2 billion years ago when atmospheric oxygen was absent.

The use of oxygen producing biocatalyst opens a new era of applied bioremediation in groundwater and soil where oxygen is at a minimum.

ZURN Hydromechanics Div.

2(b)

SUNPRO PROPOSAL P-3206R

PAGE 3

2ND ¶ PRIOR TO SEEDING THEY WOULD DETERMINE LEVEL OF CONTAMINANT

CRITTER JAN 6 1995

Terms & Cond

TCC WILL BE BASED

a TREATABILITY STUDY

CRITTER "THE BIOREMEDIATION PROCESS "A PRACTICAL GUIDELINE"

PAGE 3 METHODOLOGY DEPENDS ON GENERAL ECOLOGY CHEMISTRY & CONCENTRATIONS

APPLICATION

OBVIOUSLY COMPLEX INTERRELATIONSHIP

PAGE 4

TOXICITY "REQUIRED COMPATIBILITY TEST"

SUMMARY

- SOIL TYPE
- SOIL CHEMISTRY
- ORGANIC CONTENT
- TOXIC MATERIALS

TEMPERATURE

J. CURTISS & ASSOCIATES
524 Parkway View Drive
Pittsburgh, PA 15205
Phone: 412/788-1550
Fax: 412/788-1555

20) 5(6)

IN THE COURT OF COMMON PLEAS
STARK COUNTY, OHIO

THE CRITTER COMPANY, INC.
6890 East Sunrise Drive,
120-10
Tucson, Arizona 85715

Plaintiff,

v.

CANTON DROP FORGE, INC.
c/o William K. Cordier
4575 Southway Street S.W.
Canton, Ohio 44706

Defendant.

Case No: 1996CV00615

Judge: HAAS

COMPLAINT

Type: Other Civil - Contract Case

* * *

Plaintiff, THE CRITTER COMPANY, INC. (hereinafter "TCC"), for its cause of action states the following:

COUNT ONE

1. TCC is a for-profit Arizona corporation engaged in the production, marketing and application of micro-organisms used in the bioremediation of petroleum hydrocarbons throughout the United States. TCC is principally located at 6890 East Sunrise Drive, #120-10, Tucson, Arizona 85715.

2. Defendant, Canton Drop Forge, Inc. (hereinafter "CDF"), is a for-profit Ohio corporation with its principal place of business located at 4575 Southway Street S.W., Canton, Ohio 44706.

3. Hammontree and Associates, Limited (hereinafter "Hammontree") is an Ohio limited partnership engaged as consulting engineers, planners and surveyors and principally located at 5233 Stoneham Road, North Canton, Ohio.

4. CDF contracted with Hammontree to serve as project engineers for the bioremediation of two (2) contaminated lagoons located at 4575 Southway Street, S.W., Canton, Ohio (hereinafter "Project"). At all times relevant to the allegations below, Hammontree's statements, data transmissions, testing, and actions were within the scope of their employment with CDF.

5. In late 1994, Hammontree informed TCC that CDF would soon accept bids for the Project. The Project was designed to reduce the total petroleum hydrocarbon (hereinafter "TPH") levels within the lagoons down to the target level of three hundred eighty parts per million (380 ppm) through ex-situ bioremediation.

6. On or about December 14, 1994, TCC requested and received a laboratory analysis summary regarding Lagoon #1 from Hammontree. Said summary is attached hereto as Exhibit "A", made a part hereof, and incorporated as if fully rewritten herein.

7. TCC requested the summary for the expressed purpose of calculating it's Project bid based upon stated TPH levels as to Lagoon #1. On average, TPH levels within Lagoon #1 were represented to be approximately 35,888 ppm.

8. In April 1995, TCC received a second laboratory analysis summary for the expressed purpose of calculating it's Project bid as to Lagoon #2. Said summary is attached hereto as Exhibit "B", made a part hereof and incorporated as if fully rewritten herein. Lagoon #2's summary represented the average TPH level to be approximately 66,793 ppm.

9. Thereafter, on or about June 14, 1995, CDF and TCC executed a contract for the bioremediation of Lagoons #1 and #2. A copy of the contract is attached hereto as Exhibit "C", made a part hereof and incorporated as if fully rewritten herein.

10. TCC began its performance under the contract in July 1995. TCC constructed a treatment bio-cell adjacent to Lagoon #1. Contaminated sludge from Lagoon #1 was then transferred into the bio-cell, where TCC microbes were applied.

11. In August 1995, pursuant to the contract, samples were taken from the sludge in the bio-cell to monitor the decrease in TPH levels.

12. The sample results indicated the TPH levels in Lagoon #1 did not average 35,888 ppm, but actually averaged more than 100,000 ppm even after several weeks of bioremediation treatment.

13. On information and belief, the testing data Hammontree supplied to TCC regarding the average TPH level present in Lagoon #1 was false and made with knowledge of its falsity or with utter disregard and recklessness about its truth. CDF is responsible for Hammontree's false representations to TCC under the doctrine of *respondeat superior*.

14. The average TPH level in Lagoons #1 was material and essential to the contract between TCC and CDF given the expressed purpose of the contract was to reduce the TPH levels to CDF's target level of 380 ppm. TCC's entire bid structure was based upon the false TPH data Hammontree supplied.

15. The representations CDF made through Hammontree were intended to mislead TCC into relying upon them in TCC's bid calculations. Said conduct was wilful, malicious, wanton and oppressive to TCC.

16. Based on Hammontree's position and invitation to rely on said false representations, TCC did rely on the representations CDF made regarding TPH levels in Lagoons #1.

17. As the direct and proximate cause of Hammontree's false representations and TCC's justifiable reliance there on, TCC has been injured in the amount of Seventy-five Thousand Eight Hundred Fifty Dollars and 00/100 ($75,850.00).

COUNT II

18. TCC restates each and every allegation contained in paragraphs one (1) through seventeen (17) as if fully rewritten herein.

19. On or about April 27, 1995, TCC representatives conducted an on-site investigation of Lagoons #1 and #2.

20. In the course of TCC's investigation, CDF representatives stated Lagoon #1 was free of significant industrial debris.

21. CDF's representations regarding the debris contained in Lagoon #1 were proven false after metal stakes, shards, plate stock, I-beams, cable, rocks and chunks of concrete were discovered in Lagoon #1.

22. CDF knowingly concealed the fact that it had used Lagoon #1 as an industrial dumping ground for many years when it had a duty to disclose said fact to TCC due to the opaque nature, limited accessibility and CDF's exclusive control of Lagoon #1.

23. The Project's ex-situ bioremediation requires soil aeration and movement during biological treatment, thus the amount of debris contained in Lagoon #1 was material to the contract.

24. CDF's concealment of the fact that Lagoon #1 had been used as an industrial dump was done so with the intent of misleading TCC into believing the Lagoon was debris free and would permit TCC to easily aerate the soil, thus providing CDF with a lower overall bid price. Said conduct was wilful, malicious, wanton and oppressive to TCC.

25. TCC was forced to rely upon CDF's representations as to the debris concentration contained in Lagoon #1, and TCC did justifiably rely on CDF's representation in its bid.

26. As a direct and proximate result of CDF's concealment and TCC's justifiable reliance there on, TCC has been injured in the amount of Seventy-five Thousand Eight Hundred Fifty Dollars and 00/100 ($75,850.00).

COUNT III

27. In the alternative, TCC restates the allegations contained paragraphs one (1) through thirteen (13) as if fully rewritten herein.

28. CDF, through Hammontree, supplied TCC with laboratory data regarding Lagoon #1 in the normal course of its business.

29. CDF, through Hammontree, supplied TCC with false data as to the average TPH level contained Lagoon #1 in order to guide and assist TCC in the calculation of TCC's Project bid.

30. CDF, through Hammontree, held a duty to TCC to exercise reasonable care and competence in obtaining and then communicating the data.

31. CDF, through Hammontree, breached its duty of reasonable care and competence in obtaining and communicating the data to TCC.

32. TCC justifiably relied on the data CDF provided through Hammontree in the calculation of its bid on the Project.

33. As a direct and proximate result of CDF's negligence, TCC has been injured in the amount of Seventy-five Thousand Eight Hundred Fifty Dollars and 00/100 ($75,850.00).

COUNT IV

34. Further in the alternative, TCC restates the allegations contained paragraphs one (1) through thirteen (13) and nineteen (19) through twenty-two (22) as if fully rewritten herein.

35. CDF's representations to TCC with regard to the debris contained in Lagoon #1 was made in the normal course of its business.

36. CDF's representations to TCC were false as to the debris contained Lagoon #1 and were made order to guide and assist TCC in the preparation of TCC's Project bid.

37. CDF held a duty to TCC to exercise reasonable care and competence in obtaining and communicating the facts surrounding CDF's dumping practices in and around Lagoon #1.

38. CDF breached its duty of reasonable care and competence in obtaining and communicating its dumping practices to TCC.

39. TCC justifiably relied on the information CDF provided in the calculation of its bid on the Project.

40. As a direct and proximate result of CDF's negligence, TCC has been injured in the amount of Seventy-five Thousand Eight Hundred Fifty Dollars and 00/100 ($75,850.00).

COUNT V

41. TCC restates each and every allegation contained in paragraphs one (1) through forty (40) as if fully rewritten herein.

42. The Project's written contract, attached hereto as Exhibit "C", has become voidable due the CDF's fraud and/or negligent misrepresentation.

43. TCC has performed services and labor during the preparation, initiation and execution of the Project, the reasonable value of similar work, labor and material at the time and place they were furnished, using amounts customary and usual under the circumstances, amounting to Seventy-five Thousand Eight Hundred Fifty Dollars and 00/100 ($75,850.00).

40. TCC has no adequate remedy at law.

WHEREFORE, TCC prays for a judgment against CDF whereby:

1. As to counts I and II:

   a. The contract between TCC and CDF be rescinded and declared void by reason of fraud;

b. Compensatory damages in the sum of Seventy-Five Thousand Eight Hundred Fifty Dollars and 00/100 ($75,850.00);

c. Punitive damages in the amount of $1 million.

2. In the alternative, as to count III and IV:

a. The contract between TCC and CDF be declared void by reason of negligent misrepresentation;

b. Compensatory damages in the sum of Seventy-Five Thousand Eight Hundred Fifty Dollars and 00/100 ($75,850.00).

3. As to count V:

a. The contract between TCC and CDF be declared void by reason of fraud and/or negligent misrepresentation;

b. The sum of Seventy-Five Thousand Eight Hundred Fifty Dollars and 00/100 ($75,850.00) pursuant to the doctrine of *quantum meruit*.

4. Reasonable attorney fees and costs; and

5. Any other relief the Court deems just and equitable.

Respectfully submitted,

KING, HARGRAVE, SCURTI & JACK

BY: Christopher J. Gagin

Christopher J. Gagin
Attorney Reg. No. 0062820
P.O. Box 249
Steubenville, Ohio 43952
(614) 282-1900